AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (currently amended) A data processing apparatus comprising:

a plurality of data processing boards;

a bus connecting the boards with each other; and

~~wherein~~ each board ~~comprises~~comprising a communication utility for communicating data over the bus to another board through a plurality of channels, and wherein at least one of the channels has a user-redefinable configuration, the user-redefinable configuration including whether direct memory access (DMA) is used or not used to transfer data over the bus.

2. (original) The apparatus of claim 1 wherein each channel has a configuration that is separately user-redefinable.

3. (original) The apparatus of claim 1 wherein the at least one channel configuration is user-redefinable with one of a plurality of available configuration types.

4. (original) The apparatus of claim 1 wherein the boards are VME boards, and wherein the bus is a VME bus.

5. (original) The apparatus of claim 4 wherein the at least one channel configuration is user-redefinable with respect to at least one selected from the group consisting of: (1) a maximum data transfer size for the at least one channel, (2)a board memory allocation for the at least one channel, and (3) the conditions under which D-MA is used by the at least one channel for data transfers across the bus.

6. (currently amended) The apparatus of claim 4 wherein the communication utility is user-redefinable with respect to the number of channels through which data is communicated, the number of channels defined by at least one user input.

7. (currently amended) A data processing apparatus comprising:

a first data processing board;

a second data processing board;

a bus connecting the boards with each other; and

~~wherein~~ each board ~~comprises~~comprising a communication utility for communicating data over the bus to the other board, ~~and~~ ~~wherein~~ the communication utility communicates data according to a redefinable configuration such that a bus utilization percentage in a range from ~~approximately~~ 13% to ~~approximately~~ 25% is achieved for 8 Kbyte data transfers across the bus, the communication utility being configured to communicate data through a plurality of channels, and at least one channel has a user-redefinable configuration with respect to whether DMA is used or not used to transfer data over the bus.

8. (original) The apparatus of claim 7 wherein the boards are VME boards, and wherein the bus is a VME bus.

9. (cancelled)

10. (original) The apparatus of claim 9 wherein each channel's configuration is separately user-redefinable.

11. (original) The apparatus of claim 9 wherein at least one channel's configuration is user-redefinable with one of a plurality of available configuration types.

12. (original) The apparatus of claim 11 wherein each channel's configuration type is one selected from the group consisting of (1) a copy on send configuration type, (2) a copy to pool on receive configuration type, (3) a copy to buffer on receive configuration type, (4) a push to pool on receive configuration type, (5) a push to buffer on receive configuration type, (6) a queue on send configuration type, (7) a copy to self configuration type, (8) a queue to self configuration type, and (9) an overwrite on send configuration type.

13. (original) The apparatus of claim 9 wherein at least one channel's configuration has a user-redefinable maximum data transfer size.

14. (original) The apparatus of claim 9 wherein at least one channel's configuration has a user-redefinable board memory allocation.

15. (cancelled)

16. (original) The apparatus of claim 9 wherein the communication utility is user redefinable with respect to the number of channels through which data is communicated.

17. (previously presented) The apparatus of claim 9 wherein the communication utility is user-redefinable with respect to the number of data processing boards within the apparatus.

18. (original) The apparatus of claim 17 wherein the communication utility is user-redefinable to define a number of data processing boards for the apparatus that is larger than the number of data processing boards actually used by the apparatus.

19. (original) The apparatus of claim 7 wherein the first data processing board, the second data processing board, and the bus are implemented in a helmet for a pilot.

20. (currently amended) A method of communicating data comprising:

defining, according to user input, a redefinable communication channel configuration for communicating data over a bus between a first data processing board and a second data processing board by:

defining, according to user input, a plurality of redefinable communication channel configurations for a plurality of communication channels; and

selecting a configuration type for at least one channel, with selecting the configuration type further comprising selecting a communication channel's configuration type from the group consisting of (1) a copy on send configuration type, (2) a copy to pool on receive configuration type, (3) a copy to buffer on receive configuration type, (4) a push to pool on receive configuration type, (5) a push to buffer on receive configuration type, (6) a queue on send configuration type, (7) a copy to self configuration type, (8) a queue to self configuration type, and (9) an overwrite on send configuration type; and

communicating data according to the defined communication channel configuration from one board to the other over the bus.

21. (currently amended) The method of claim 20 wherein ~~the defining step comprises defining, according to user input, a plurality of redefinable communication channel configurations for a plurality of communication channels, and wherein~~ the communicating step comprises communicating data from one board to the other over the bus according to the defined communication channel configurations.

22. (currently amended) The method of claim [[21]]20 wherein ~~the~~ defining ~~step~~ the communication channel comprises defining each communication channel's configuration separately.

23. (cancelled)

24. (cancelled)

25. (currently amended) The method of claim 22 wherein ~~the~~ defining ~~step~~ the communication channel further comprises allocating, according to user input, board memory for each of the communication channels.

26. (currently amended) The method of claim 22 wherein ~~the~~ defining ~~step~~ the communication channel further comprises defining a maximum data transfer size for at least one communication channel.

27. (currently amended) The method of claim 22 wherein ~~the~~ defining ~~step~~ the communication channel further comprises, for at least one communication channel, defining the conditions under which it uses DMA to transfer data over the bus.

28. (currently amended) The method of claim 22 wherein ~~the~~ defining ~~step~~ the communication channel further comprises defining the number of communication channels.

29. (currently amended) The method of claim 22 wherein ~~the~~ defining ~~step~~ the communication channel further comprises defining a data processing board capacity for the bus.

30. (currently amended) The method of claim 20 wherein ~~the~~ communicating ~~step~~ the data further comprises communicating the data from one board to the other over the bus with a bus utilization percentage in a range of ~~approximately~~ 13% to ~~approximately~~ 25% for 8 Kbytes data transfers across the bus.

31. (currently amended) The method of claim 30 wherein ~~the~~ defining ~~step~~ the communication channel further comprises defining, according to user input, a plurality of redefinable communication channel configurations for a plurality of communication channels, and wherein the communicating step comprises communicating data from one board to the other over the bus according to the defined communication channel configurations.

32. (currently amended) The method of claim 31 wherein ~~the~~ defining ~~step~~ the communication channel further comprises defining each communication channel's configuration separately.

33. (original) The method of claim 20 wherein the boards are VME boards and wherein the bus is a VME bus.

34. (currently amended) A method of configuring a communication utility for transporting data from a first processor to a second processor over a bus, the method comprising:

defining a configuration for a channel through which data is communicated over a bus by a communication utility interfacing ~~at least a~~the first processor with [[a]]the second processor, the channel configuration redefinable by a user based on at least one user input, the user input including at least one of a configuration for the transfer of data over the bus selected from a DMA transfer or a non-DMA transfer; and

in accordance with the defined channel configurations, compiling software for controlling the communication utility.

35. (cancelled)

36. (currently amended) The method of claim [[35]]34 wherein ~~the~~ defining ~~step~~ the configuration further comprises defining a plurality of redefinable configurations for a plurality of channels through which data is communicated by the communication utility.

37. (currently amended) The method of claim 36 wherein ~~the~~ defining ~~step~~ the configuration further comprises selecting a configuration type for each channel from a plurality of available configuration types.

38. (original) The method of claim 37 wherein one of the available configuration types is a copy on send configuration type.

39. (original) The method of claim 37 wherein one of the available configuration types is a copy to pool on receive configuration type.

40. (original) The method of claim 37 wherein one of the available configuration types is a copy to buffer on receive configuration type.

41. (original) The method of claim 37 wherein one of the available configuration types is a push to pool on receive configuration type.

42. (original) The method of claim 37 wherein one of the available configuration types is a push to buffer on receive configuration type.

43. (original) The method of claim 37 wherein one of the available configuration types is a queue on send configuration type.

44. (original) The method of claim 37 wherein one of the available configuration types is a copy to self configuration type.

45. (original) The method of claim 37 wherein one of the available configuration types is an overwrite on send configuration type.

46. (original) The method of claim 37 wherein one of the available configuration types is a queue to self configuration type.

47. (currently amended) The method of claim 36 wherein ~~the~~ defining ~~step~~ the configuration further comprises selecting a maximum data transfer size for a channel.

48. (currently amended) The method of claim 36 wherein ~~the~~ defining ~~step~~ the configuration further comprises allocating memory space to a channel.

49. (currently amended) The method of claim 48 wherein ~~the allocating step~~ defining the configuration further comprises selecting at least one from the group consisting of (1) a receive queue size for a channel, (2) a receive pool size for a channel, (3) a transmit pool size for a channel, and (4) a push queue size for a channel.

50. (currently amended) The method of claim 36 wherein ~~the~~ defining ~~step~~ the communication channel further comprises defining the conditions under which a channel uses a DMA data transfer.

51. (currently amended) The method of claim 36 wherein ~~the~~ defining ~~step~~ the communication channel further includes defining the number of channels through which data is communicated.

52. (original) The method of claim 36 wherein the first processor resides on a first VME board, wherein the second processor resides on a second VME board, and wherein the bus is a VME bus.

53. (currently amended) The method of claim 36 wherein ~~the~~ defining ~~step~~ the communication channel further comprises defining the channel configurations according to data entry by a user via a graphical user interface (GUI).

54. (currently amended) A device comprising:

a user interface through which a user provides configuration data; and

a processor configured to receive the configuration data from the user interface and generate a configuration file therefrom, the configuration file comprising configuration information for a plurality of channels over a bus that interconnects a plurality of data processing boards, the configuration information including at least one of (1) a copy on send configuration type, (2) a copy to pool on receive configuration type, (3) a copy to buffer on receive configuration type, (4) a push to pool on receive configuration type, (5) a push to buffer on receive configuration type, (6) a queue on send configuration type, (7) a copy to self configuration type, (8) a queue to self configuration type, and (9) an overwrite on send configuration type.

55. (original) The device of claim 54 wherein the user interface is a graphical user interface (GUI).

56. (currently amended) The device of claim 55 wherein the GUI ~~is configured to~~receives user input to allow the user to define the number of channels through which data is communicated over the bus.

57. (currently amended) The device of claim 55 wherein the GUI ~~is configured to~~receives user input to allow the user to define a configuration type for each channel.

58. (original) The device of claim 57 wherein the GUI is further configured to (1) display a list of available user-selectable configuration types for each channel, and (2) receive user input corresponding to a selection of a configuration type from the list for a channel.

59. (original) The device of claim 55 wherein the GUI is configured to allow a user to define a maximum data transfer size for each channel.

60. (original) The device of claim 55 wherein the GUI is configured to (1) display a memory allocation for each channel, and (2) receive a modification to a channel's memory allocation from the user.

61. (original) The device of claim 55 wherein the GUI is configured to (1) display the conditions under which a channel is to use DMA during data transfers over the bus, and (2) receive a modification to the conditions under which a channel is to use DMA during data transfers over the bus.

62. (original) The device of claim 55 wherein the GUI is configured to, in response to user input, generate software in accordance with generated configuration file, the software defining how data is communicated over the bus between the boards.

63. (currently amended) A device comprising:

a user interface through which a user specifies a stored configuration file, the configuration file comprising configuration information for a plurality of channels over a bus that interconnects a plurality of data processing boards the configuration file including whether to use DMA for the data transfers over the bus; and

a processor configured to retrieve the specified configuration file and generate software in accordance with the retrieved configuration file, the software for controlling data communications over the bus between the boards.

64. (original) The device of claim 63 wherein the user interface is a UNIX command line interface.

65. (currently amended) A computer-readable medium comprising:

a plurality of instructions that are executable by a computer for managing data communication over a bus between a first data processing board and a second data processing board, the one or more instructions defining how the ~~board's~~ boards communicate data therebetween over the bus through a plurality of communication channels, ~~wherein~~ including whether or not DMA is used to transfer the data over the

bus, and at least one of the communication channels possesses a redefinable configuration.

66. (currently amended) A computer-readable medium comprising:

a plurality of instructions that are executable by a computer for presenting a user interface on the computer through which a user provides configuration data; and

a plurality of instructions that are executable by the computer for receiving configuration data from the user interface and generating a configuration file therefrom, the configuration file comprising configuration information for a plurality of channels over a bus that interconnects a plurality of data processing boards, the configuration data including whether or not DMA is used to transfer data over the bus.